THE MAKING OF A TELEVISION DRAMA SERIES

DOCTOR WHO

# UNDERWORLD

TIME-SCOOP

UK: £2(rec) US: $4.50 Canada: $5.95

CMS

ISSUE 28

Cover by Tony Clark

UNDERWORLD SERIAL 4Y, SEASON 15, STORY 96

# Context

UNDERWORLD was the first **Doctor Who** since 1974 not to be script edited by Robert Holmes. And Andrew Martin thinks it shows (see his review on page 8).

But the story is better known for its extensive use of Chroma-Key to provide the cave settings of the underworld. Opinions as to the success of the venture vary, but certainly it was a brave move, forced on the production team at the last moment (see *Production*, page 10).

What is not so well known is just how primitive the equipment for post-production video effects was at the BBC in 1977. A. J. ("Mitch") Mitchell explains the difficulties of electronic effects, and in particular the challenges posed by UNDERWORLD in his article *Moving Pictures* (page 4).

In summary, UNDERWORLD is a rather lightweight story with little outstanding to remember apart from its effects work. The late Graham Williams (pages 3 & 13) told **IN-VISION** his feelings about the finished result, and the other problems he was facing - with the next story, and with his leading actor. □

**IN-VISION (ISSN 0953-3303) Issue 28, completed October 1990, first published November 1990**
**COMMISSIONING AND CONTRIBUTING EDITORS:** Justin Richards and Peter Anghelides
**PUBLISHER:** Jeremy Bentham
**DISTRIBUTION ASSOCIATE:** Bruce Campbell
**CONTRIBUTORS TO THIS ISSUE:** Bob Baker, Alison Bauget, Tony Clark, Andrew Martin, A.J. Mitchell, John Nathan-Turner, Percy Farney, Andrew Pixley, Tim Robins, Martin Wiggins, Graham Williams
**FORMAT BY:** Justin Richards/Peter Anghelides, June 1986
**DOCTOR WHO COPYRIGHT:** BBC tv 1977, 1990
**PHOTO ORIGINATION:** Vogue Typesetters
**COLOUR:** Banbury Repro
**PRINTERS:** Banbury Litho
**EDITORIAL ADDRESS:** 29 Humphris Street, Warwick CV34 5RA UK
**SUBSCRIPTIONS:** 8 issues for £16 (add £2 for card envelopes) to: Jeremy Bentham, 13 Northfield Road, Borehamwood, Hertfordshire WD6 4AE UK

## CAST

DOCTOR WHO ..... Tom Baker
LEELA ..... Louise Jameson
VOICE OF K-9..... John Leeson
TALA ..... Imogen Bickford-Smith
HERRICK ..... Alan Lake
JACKSON ..... James Maxwell
ORFE ..... Jonathan Newth
IDMON ..... Jimmy Garner (2-4)
TARN ..... Godfrey James (2-4)
RASK ..... James Marcus (2-4)
GUARD KLIMT ..... Jay Neill (2)
IDAS ..... Norman Tipton (2-4)
ANKH ..... Frank Jarvis (3-4)
LAKH ..... Richard Shaw (3-4)
NAIA ..... Stacey Tendeter (3-4)
VOICE OF THE ORACLE
Christine Pollon (3-4)

## SMALL & NON -SPEAKING

No BBC records (see *Production*)

## CREW

TITLE MUSIC.....Ron Grainer & the BBC Radiophonic Workshop
PRODUCTION ASSISTANT
Mike Cager
ASSISTANT FLOOR MANAGER
Gary Downie
DIRECTOR'S ASSISTANT
Sue Mansfield
FLOOR ASSISTANT .. Sue Williams
STUDIO LIGHTING. Mike Jefferies
TECHNICAL MANAGER
Mike Chislett
STUDIO SOUND ..... Richard Chubb
GRAMS OPERATOR
Gerry Borrows
VISION MIXER..... Shirley Coward
ELECTRONIC EFFECTS
A. J. Mitchell
CREW.....10
FILM EDITOR..... Richard Trevor
COSTUME DESIGNER
Rupert Jarvis
MAKE-UP ARTIST
Cecile Hay-Arthur
MAKE-UP ASSISTANTS
Jane Berry, Sinikka Ikaheimo, Margaret Magee, Dandra Powell
VISUAL EFFECTS DESIGNER
Richard Conway
PROPERTIES BUYER
Bob Warans
DESIGNER..... Dick Coles
DESIGN ASSISTANT
Jane Shepherd
INCIDENTAL MUSIC
Dudley Simpson
SPECIAL SOUND
Paddy Kingsland
PRODUCTION UNIT MANAGER
John Nathan Turner
STORY....Bob Baker & Dave Martin
SCRIPT EDITOR.....Anthony Read
PRODUCER.....Graham Williams
DIRECTOR..... Norman Stewart

## TRANSMISSION

**Part 1**: 7 January 1978, 18.24.56 (22' 36")
**Part 2**: 14 January 1978, 18.26.43 (21'27")
**Part 3**: 21 December 1977, 18.30.52 (22'21")
**Part 4**: 28 December 1977, 18.29.03 (25'23")

## FILM

**Part 1**: specially-shot model film, 35mm, silent, 261 ft. (opening and closing titles, 35mm, sound 122 ft.)
**Part 2**: specially-shot model film, 35mm, silent, 59ft ft. (plus 21 ft. reprised from part 1; opening and closing titles, 35mm, sound 123 ft.)
**Part 3**: stock opening and closing titles, 35mm, sound, 128 ft.
**Part 4**: specially-shot model film, 35mm, silent, 92 ft.; specially-shot model film, 16mm, silent, 16 ft. (opening and closing titles, 35mm, sound 126 ft.)

## RECORDING

3rd, 4th October 1977 (TC3 or 4)
15-18th October 1977 (TC3 or 4)
21 October 1977 (TC3 or 4, Gallery only session)

## VT EDITING

19-20th, 24-28th October 1977

## VT NUMBERS

**Part 1**: VTC/6HT/B19819/ED
**Part 2**: VTC/6HT/B19820/ED/ED
**Part 3**: VTC/6HT/B19821/ED/ED
**Part 4**: VTC/6HT/B19822/ED

Original recording numbers for studio RX:
3 Oct: VTC/6HT/B1913/A and /B
4 Oct: VTC/6HT/B1914/A, /B, /C
15 Oct: VTC/6HT/B1915/A and /B
16 Oct: VTC/6HT/B1916/A, /B, /C
17 Oct: VTC/6HT/B1917/A, /B, /C
18 Oct: VTC/6HT/B1918/A, /B, /C

## SYPHER DUB

**Part 1**: 19th October 1977
**Part 2**: 30th October 1977
**Part 3**: 27th October 1977 (BBC records say 27th December - this is almost certainly an error)
**Part 4**: 27th October 1977

## PROJECT NO.s

**1**: 2347/2241 **2**:2347/2242
**3**: 2347/2243 **4**:2247/2244

## MUSIC

**Part 1**: 5'12"
**Part 2**: 9'25" (plus 46" in episode 1 reprise)
**Part 3**: 9'23" and 1'44"
**Part 4**: 4'55" (plus 22" in episode 3 reprise)

## REFERENCES LITERATURE

DICKS, Terrance *Doctor Who and the Underworld* (Target, 1980)
PEAKE, Mervyn. *Gormenghast*
PEAKE, Mervyn. *Titus Alone*
PEAKE, Mervyn. *Titus Groan*
TULLOCH, John & ALVARADO, Manuel. *Doctor Who: The Unfolding Text* (MacMillan, 1983)
SHELLEY, Mary. *Frankenstein* (1816)

## ARTICLES

*DWAS Yearbook* May 1978 (Review of story by Gordon Blows - sorry the Pacifier was dropped after part one)
*DWB* 61, December 1988 (Justin Richards identifies R.1.C. as 'Argosy', cf Argo, and finds the story's ending "contrived and obvious".)
*Shada Special*, December 1983 (Thomas Noonan compares to THE HORNS OF NIMON - playing off heroic myth against the mock-heroic Doctor)
*Starburst* 30 (Mitch Mitchell interview)

# Graham Williams

I HAD made the mistake of going away on holiday, my first and only holiday in two years.

But I came back to find that the designer, an awfully clever chap named Dick Coles, had blown the entire budget on the spaceship.

We were now hours away from the construction deadline, and so it was pretty much unstoppable.

I had had conversations with him before about one of his long-standing ambitions, which was to do Mervyn Peake's *Titus* trilogy, using just ChromaKey for the sets.

At the time I had thought: "Gosh, that's a pretty brave idea. I'm glad I won't be doing it.".

However, when this business blew up, we started talking and loking at the scripts in the caves with a view to saying: "It's either going to be done it that way, or all against black backdrops".

Again, it has to be borne in mind that, during those three years, inflation was running at breakneck speed. We were almost hourly being told the costs had just gone up by another ten per cent. The knock-on effects was like compound interest, with everything spiraling up into quite lunatic sums.

I had already had several long and very severe conversations with the bosses upstairs, to the effect that they didn't care how I spent my money, as long as it was money from that year. Once that was gone, there was no question of over-funding. I would just lose episodes, end of argument. Philip Hinchcliffe had not left me with too much of a reputation, because so many of his **Doctor Who**s had gone massively over-budget on scenery.

After so much consistent overspending that previous year, I was told (a) I could not overspend by a penny, and (b) I could not overrun by a minute.

Given the situation was that stark, it was not a difficult decision at all that we would have to resort to doing our caves on ChromaKey, especially as I did not relish doing it all against black backgrounds.

Norman Stewart reckoned he could do it okay, although as it turned out I think he was a little over-confident.

We did need about four times as much studio time, as we had to plan and line up every shot the way we wanted it.

So the compromise was that we were recording ChromaKey at a rate that was unheard of - cutting eight or nine minutes in an hour, when the normal rate would be about one minute of ChromaKey per hour.

In effect, we were trying things never done before - asking untutored crowd-scene actors to run into a blue studio and to stop on their blue marks on a blue cloth. An inch or two out of line and you'd get legs disappearing, and the shot wouldn't work.

We'd retry as often as we could, but there would have to be a cut-off point where you go into the next shot and take the best of what you have.

We got it all done and on time. But of course, you have to face the eternal project management triangle of Cost against Quality against Time. You can get two of those elements always, but only if you sacrifice the third.

So UNDERWORLD came in on time and within its budget, but I'm not that proud of its quality. □

*Tardis* 3/2 , April 1978 (review by Neil Blomley: "...one of the best stories of this season..."); 3/5, October 1978 (Anthony Read interview)

## FILMS

*Jason and the Argonauts* (Chaffey, 1963)
*Star Wars* (Lucas, 1977)
*2001: A Space Odyssey* (Kubrick, 1968)

## TELEVISION

*The Black and White Minstrel Show* (BBC)
*Blake's Seven* (BBC 1978-81)
*Crackerjack* (BBC)
*Doctor Who* (BBC, 1963- )
*Hammer House of Horror* (Hammer, 1979-81)
*The Journal of Bridget Hitler* (BBC)
*Star Trek - The Next Generation* (Paramount, 1987- )
*Sutherland's Law* (BBC, 1972-76)
*Top of the Pops* (BBC)
*Z Cars* (BBC, 1960-78)

## DOCTOR WHO

The Ambassadors of Death (CCC)
The Claws of Axos (GGG)
The Creature from the Pit (5G)
The Daleks (B)
Horror of Fang Rock (4V)
Image of the Fendahl (4X)
The Invasion of Time (4Z)
The Invisible Enemy (4T)
Mawdryn Undead (6F)
The Mind of Evil (FFF)
The Moonbase (HH)
The Mutants (NNN)
The Robots of Death (4R)
The Sun Makers (4W)
Underworld (4Y)
The War Machines (BB)

***Rask prepares to sacrifice Idmon to the Oracle***

# Moving Pictures

Electronic video effects is the fastest-expanding field in film and television. The facilities and imagery it affords to the finished picture is sought after by everyone from sports editors to "blockbuster" movie makers. In Britain, this expansion started in the mid-seventies, when a combination of new equipment and artistic invention combined to create startling new effects for the small screen. As ever, Doctor Who was a principal user of these new developments, and rarely more so than in UNDERWORLD, made in 1977.

A.J. "Mitch" Mitchell was the electronic effects designer on that show. For **IN-VISION**, he reviews the world of video effects, and traces the role **Doctor Who** played in those formative years.

THE BBC had recognised the situtation with regard to models and so-called mechanical effects from very early on. They had Jack Kine and Bernard Wilkie, who had built up the Visual Effects Department since the fifties.

On the technical side there was a special effects job too in those early days. This was primarily brought onto productions like **The Black and White Minstrel Show**, which had some incredible efects and routines done using inlays and overlays.

Unfortunately, there then developed a power struggle as this field got biger. What they wanted to work out was a power base for operating the studio - or rather, who would become the equivalent of a film studio's director of photography (that is, the technical boss).

In the days of live TV, it was essential that one person had control, and that was the Technical Operations Manager (or TOM). And it was felt that these "special effects guys" were undermining that authority. So the job was done away with entirely, and replaced by an operational post with no planning responsibility at all. This new job became known as Inlay Operator.

Eventually, it settled down into a formula, whereby a camera assistant from the Camera Department would do a three-month attachment in the Vision Department to learn about inlay and overlay. (The Vision Department was the area which covered lighting as well as vision.) To go onto that scheme, you had to be someone who knew something about photography, because you were required to work with masks and cut-outs, and to prepare 35mm slides.

The clever bit, which kept the inlay people in such a lowly position for so long, was that they could only come from the Camera Department. And you could only do that job for three months before going back to normal camera duties again. This meant that no-one ever did the job logn enough to form expert knowledge, special relationships with programmes, or even to become more than just competent.

That is how I began my history in efects, moving over for three months from being a camera assistant, to learn inlay and overlay. It was something I quickly developed a keen interest in, particularly doing 'trick' shots, anything that was out of the ordinary and looked 'clever'.

I did a lot of **Top of the Pops**. That was always recorded in Studio G at Lime Grove, which was the only studio to have a special Bosch wipe and inlay machine for doing realy kinky transitions. I got quite involved in producing cels, cut-outs and masks that produced quite amazing effects on screen. Because, as well as black and white, you could work with diferent shades of grey to blend and mix pictures.

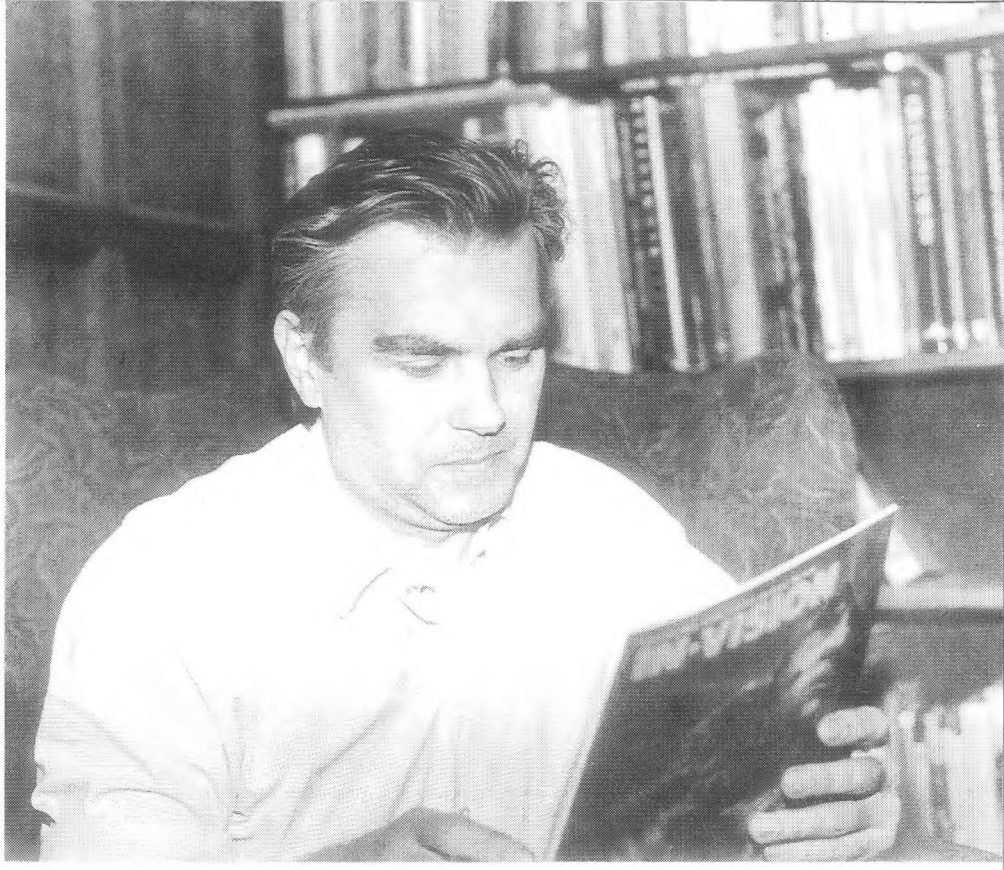
But I got fed up when I realised I was doing all this and not getting paid for it. Then, after my three months, I was sent back to the Camera Department and told "That was it". So I took all these slides and things I had made, and wouldn't let the Vision Department use them.

Nothing much changed until the early seventies when, again on attachment, I started working on **Doctor Who**. This was at the time that Barry Lets was producing it. Bary was very heavily into all things technical, and he loved doing effects. Very often he would suggest ideas of his own to see if they could be done. I worked with him on THE AMBASSADORS OF DEATH, basically doing experiments with ChromaKey which was quite a new thing for the BBC in 1970. My main memory of that show was our short-lived romance with yellow ChromaKey. It worked best for about six months, until the technology changed again and blue suddenly resumed its position as most suitable colour. At one point, we had to drape a whole fork lift truck in yelow cloth to do a scene of the Doctor walking, almost weightless, through an alien spacecraft as the arm lifted him up and down.

I then did something which was very much *not* the done thing. I started talking to Bary in the bar about ideas for effects, and started building little things for him to use to achieve those effects. So when it was time for him to complete my attachment, Barry and I had to play a game of politics with the management to get them to keep me on the show.

I forget the exact details of how we did it, but essentially, it could not be admitted that I had built these things for Barry. Because that would make me a supervisor or designer or something, and would mess up their nice simple system. Nevertheless, I had designed them and Barry needed them for his show: although they theoretically didn't exist, there had to be someone on **Doctor Who** that knew how they worked! So I was quietly left on the programme for five and a half months to get on with it.

During that time, I like to think we started to develop some quite amazing and complicated effects for **Doctor Who**, certainly to a point where you did not want to entrust all this kit to a young guy who has never used it before. To me it seemed crazy that you took on someone new for three month's training, but only at the end of those three months would he be really useful to a production. And it was just at that point - when he'd start to be useful - that he'd be sent back to cameras.



So I wrote a training manual for inlay, totally ignorant at the time that there had been all this political in-fighting years ago about the role of the effects specialist. After my five and a half month stint with Barry I back that up with the suggestion that there should be a permanent, full-time pool of cameramen who were trained inlay operators who could, when required, be pulled off to handle shows with a high requirement for inlay efects.
To my delight, and my amazement, within a few months of my having been promoted to the position of cameraman (and four years after submitting my report), I was called into my manager's office and told that the BBC were advertising internally for people to become electronic effects operators.
Three of us got the job: Dave Chapman, Dave Jervis, and me. Right from the start it was a very good partnership. I was very into the photographic side of the job, having a strong background in camerawork. Dave Jervis was far more involved in the electronics and technical side.
All the **Doctor Whos** I worked on up until UNDERWORLD had their effects put on 'live' during studio recording days. The big change that happened on that story, that had to happen just to complete everything on time, was post-production. It just was not possible during live recording to do all the moving beam shots and such, without upsetting everyone else in the studio.
At the time, *Star Wars* had just come out. Graham Williams, the producer, had seen the film, and wanted UNDERWORLD to look technically more sophisticated. So he fought for (and got) a gallery-only day, when just the technicians and the director could come in and do post-production work - adding beams and ray gun shots to tape and film that had already been recorded.
The problem with doing sequences like people running in and firing lasers is that actors find it terribly difficult to suddnly stop and stand absolutely rigid with a gun pointing, while the guy up in the gallery lines up his masks or wipes or whatever. Similarly, unless the camera is locked off for the entire scene, there is always some camera movement that will make it almost impossible to get a perfectly-aligned laser beam.
In *Star Wars*, there are people running everywhere as they fire off laser guns. Once that has happened, and the audience starts to accept *Star Wars* as the standard, then the rest of the industry must atempt to do the same, or get left behind.
We were able to get our gallery-only sessions on days when a studio was being de-rigged of one lot of sets, having its floors washed, and another show's sets put up. You would be able to come into the control room, link up a few two-inch video machines to the effects kits and do post-production work.
In that way, it's no problem to add effects to a scene with actors running on, firing lasers, and running off again. You just keep rerunning V.T. and stopping it at the point where you want to mark the screen with a chinagraph pencil, line up the effects, and re-record the sequence with the effect added for as many seconds or as many frames as you want.
UNDERWORLD did give us some problems we had not anticipated. So many times did we play and replay scenes, that we started to annoy the V.T. boys - because the tape was beginning to shed oxide, and they were getting drop-outs on the playback.
I remember there was a long pre-production meeting about UNDERWORLD, mostly because we all needed to work out how we were going to do all these shots. Literally, it went on all day and all through the night as we hacked our way through the script, figuring out how to do the cave sets, the laser beams, what to keep in, what had to be cut out - the works.
An interesting challenge was the rocks. We wanted to do shots where someone jumps up from behind a foreground rock and then runs round to stand in front of that same rock. To do that, you needed a three-camera set-up: one camera looking at the model of the tunnel, another on the actor standing against blue, and a third looking at rocks. The picture of those rocks would play up to my monitor, which would enable me to trace and cut out a mask shaped like the rocks. That would then go onto my light box so that the rocks would stand out like a silhouette.
That silhouete would enable the rocks on the third camera to be dropped into, and on top of, the composite picture of the actors in the caves. The technical term for that is a hold back matte or, in BBC-speak, "keys in cascade". The trick was then to remove that second 'key' at precisely the right instant when the actor runs out from behind the rocks and comes around to stand in the foreground.
There were a lot of shots like that on UNDERWORLD. And of course we hit the problem of picture degradation, because most of the things were being done in post-production. To do scenes where loads of people are runing through model caves, with foreground models added on top and lasers firing at different times, you were copying and building a scene

of up to fourteen generations. The industry specification for two-inch tape was then a maximum of five generations, so by that stage the final picture would become horribly green and look very grainy.

Today, such picture quality would be unacceptable. But that is because we now have digital technology which enables you to copy images over and over again without loss of quality. But in 1977, we hadn't even got the first Quantel 5000 machine.

I think we had the Quantel 3000 machine in 1977, a frame store synchroniser. This enabled you to store a frame of video picture in a memory. The effect was rather like a pause button on a VCR, except you didn't have the video heads running against the same piece of tape constantly. People's response to the 3000 was what gave Quantel the idea od producing an effects machine later on.

Quantel was originally a company called Micro Consultants, who were looking for new outlets to sell technology they had developed for military uses. They targeted medicine and television as two concerns who might be interested, and launched this subsidiary company Quantel - named after "quantise" (which is where you digitise a picture) and "tel" (short for television).

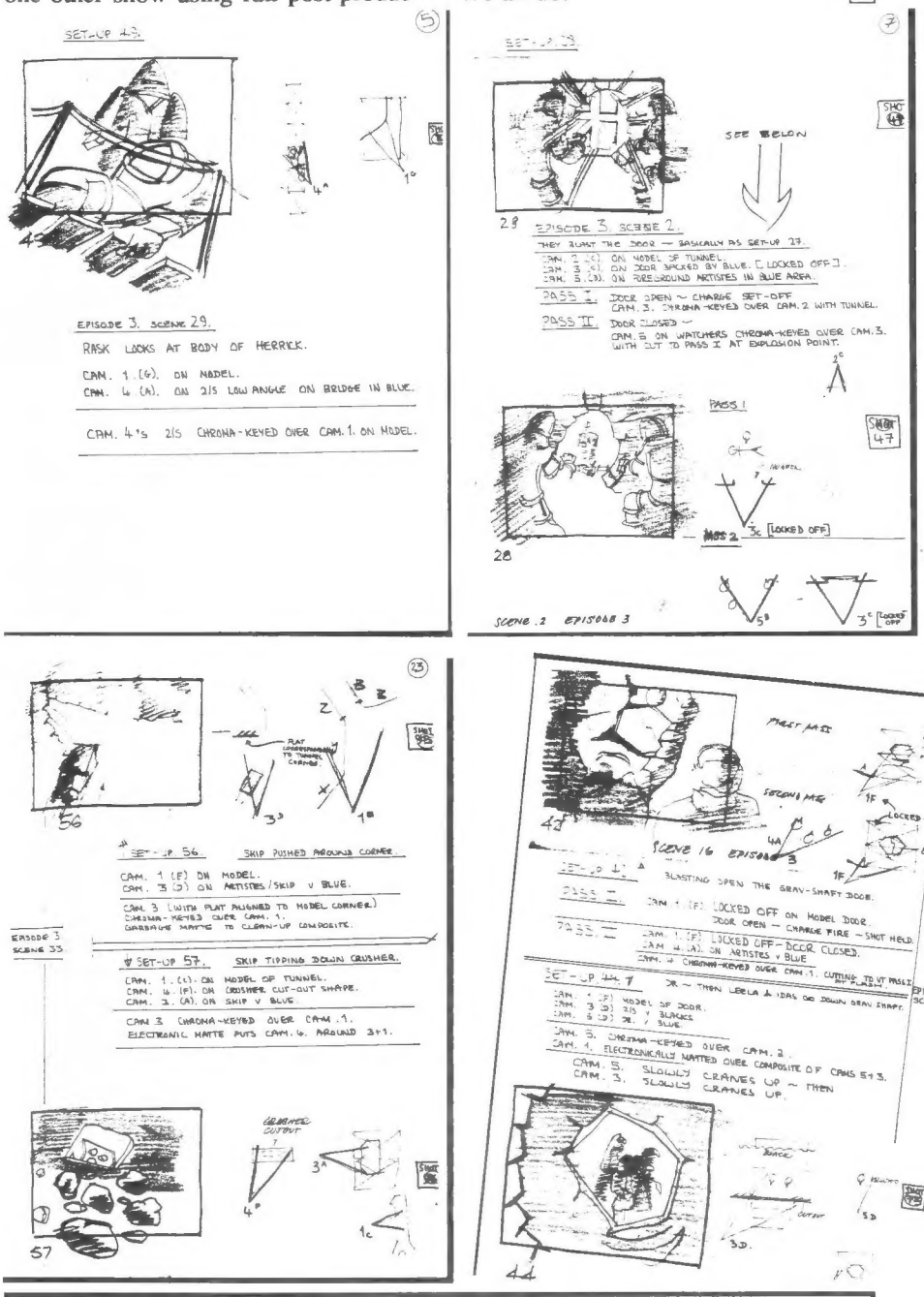
Their first product was a digital time-base corrector, which helped to stabilise the picture from non-broadcast video machines. That then gave them the idea for a machine that, instead of processing just one line in a picture at a time, could process the whole picture by storing it internally in digital form. That led to the development of the Quantel 5000, a fully-digital effects machine which for a while was known as "The Quantel". Later this technology was refered to as a DVE (digital video effects), but nowadays is generically called a "picture mover".

The BBC and The Moving Picture Company had the first two prototypes around 1979, two years too late to help us with our freeze-frames on UNDERWORLD.

Video disc was a facility we would very rarely get access to. Until the development of one-inch tape gave them easier and cheaper ways to do slow-motion replays, the Sports department used the video disc machine almost exclusively. The only time I can remember using it on **Doctor Who** was for HORROR OF FANG ROCK, when we used it to do the sequence of the creeper wrapping itself around people. It was a very expensive piece of equipment, and there were only two in the U.K.. One was at London Weekend Television (LWT) for ITV Sport, and the other was hidden somewhere in the basement of BBC Televison Centre.

In the end I think UNDERWORLD proved very expensive, and a lot of hard work administratively - organising all of those separate sessions. As far as I know, they've never done another **Doctor Who** that way since.

Before leaving the Corporation, I did do one other show using full post-production compositing (including ChromaKey). That was **The Journal of Bridget Hitler**, directed by Philip Saville. After that one, the management banned post-production effects for a time as being too resource-hungry. Years later they organised it properly with a purpose-built video efects studio, where the two Daves are still creating visual magic, but on purpose-built kit. They still have nightmares about gallery-only session, though. We all do! □


SET-UP 43.
EPISODE 3. SCENE 29.
RASK LOOKS AT BODY OF HERRICK.
CAM. 1. (G). ON MODEL.
CAM. 4 (A). ON 2/S LOW ANGLE ON BRIDGE IN BLUE.
CAM. 4's 2/S CHROMA-KEYED OVER CAM. 1. ON MODEL.
SET-UP 39.
SEE BELOW
EPISODE 3. SCENE 2.
THEY BLAST THE DOOR — BASICALLY AS SET-UP 29.
CAM. 2 (C). ON MODEL OF TUNNEL.
CAM. 3 (C). ON DOOR BACKED BY BLUE. [LOCKED OFF].
CAM. 5 (D). ON FOREGROUND ARTISTES IN BLUE AREA.
PASS I. DOOR OPEN — CHARGE SET-OFF.
CAM. 3. CHROMA-KEYED OVER CAM. 2 WITH TUNNEL.
PASS II. DOOR CLOSED —
CAM. 5 ON WATCHERS CHROMA-KEYED OVER CAM. 3. WITH CUT TO PASS I AT EXPLOSION POINT.
PASS I
Shot 2 3c [LOCKED OFF]
SCENE 2 EPISODE 3
SET-UP 56. SKIP PUSHED AROUND CORNER.
CAM. 1 (F) ON MODEL.
CAM. 3 (D) ON ARTISTES/SKIP V BLUE.
CAM. 3 (WITH PLAT ALIGNED TO MODEL CORNER)
CHROMA-KEYED OVER CAM. 1.
GARBAGE MATTE TO CLEAN-UP COMPOSITE.
EPISODE 3
SCENE 33.
SET-UP 57. SKIP TIPPING DOWN CRUSHER.
CAM. 1. (C). ON MODEL OF TUNNEL.
CAM. 4. (F). ON CRUSHER CUT-OUT SHAPE.
CAM. 3. (A). ON SKIP V BLUE.
CAM 3 CHROMA-KEYED OVER CAM. 1.
ELECTRONIC MATTE PUTS CAM. 4. AROUND 3+1.
SCENE 16 EPISODE 3
SET-UP 41. A BLASTING OPEN THE GRAV-SHAFT DOOR.
PASS —
CAM. 1 (F) LOCKED OFF ON MODEL DOOR.
DOOR OPEN — CHARGE FIRE — SHOT HELD.
PASS —
CAM. 1 (F) LOCKED OFF — DOOR CLOSED.
CAM. 4 (A). ON ARTISTES V BLUE.
CAM. 4 CHROMA-KEYED OVER CAM. 1. CUTTING TO IT PASS I.
SET-UP 44.
CAM. 1 (F) MODEL OF DOOR.
CAM. 3 (D) 3/S V BLANKS
CAM. 5 (D) 3/S V BLUE.
CAM. 3. CHROMA-KEYED OVER CAM. 2.
CAM. 1. ELECTRONICALLY MATTED OVER COMPOSITE OF CAMS 5+3.
CAM. 5. SLOWLY CRANES UP — THEN
CAM. 3. SLOWLY CRANES UP.

## Guide to the storyboards

The storyboards above were compiled by A. J. Mitchell for the cast and crew of UNDERWORLD. There are 66 pages in all, the few above are a representative sample. Each shows a drawing (by designer Dick Coles) showing the finished composite shot. To the right of this are diagrams showing the position of the cameras relative to (left) the blue ChromaKey set and (right) the model caves. Also shown are Mitch's instructions and words of encouragement, like "Track simultaneously - and the best of luck!"

# Audience

ITV (LONDON region) **SATURDAY 7th JANUARY 1978**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S P O R T | N E W S | CELEBRITY SQUARES quiz | THE MAN FROM ATLANTIS C.W.Hyde | | OF THE CENT-URY | film THE BATTLE OF THE BULGE | | | | N E W S | DIONNE WARWICKE CELEBRITY CONCERT | |

5:00 5:30 6:00 6:30 7:00 7:30 8:00 8:30 9:00 9:30 10:00 10:30 11:00

BBC 1

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S P O R T | BAT-MAN cart-oon | N E W S | JIM'LL FIT IT | DR. WHO Und 1. | film CITY BENEATH THE SEA | | THE TWO RONNIES | STARSKY AND HUTCH | N E W S | F.A.Cup MATCH OF THE DAY | | PARK-INSON |

5:00 5:30 6:00 6:30 7:00 7:30 8:00 8:30 9:00 9:30 10:00 10:30 11:00

BBC 2

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HORIZON rpt. | INDOOR BOWLS | THE LIVELY ARTS Don Carlos Acts 1 & 2 | | | N E W S | Don Carlos Act3 | OPEN DO -OR | Don Carlos Acts 4 & 5 | | | film FRGT. CITY |

## SATURDAY

**Dr Who** (Tom Baker, below) and Leela face thrilling new dangers from a fresh set of extra-terrestrial beings on a planet on the edge of creation in the four-part story beginning

today (**Underworld**, 6.25). Fortunately they will have the help of that canny robot K9.

PLAYWRIGHT Fay Weldon found herself at odds with her children, previewing **Doctor Who**'s return on January 7th 1978. "They are far less easily frightened than I am. They tell me, to reassure me, just how the effects are achieved. I disapprove of Leela, who is so handy with her murderous knife. It's sexism. They would never let a male hero behave in such a way. I mutter about it and the children simply look at me as if I were mad. It is all part of their Saturday afternoon entertainment."

In the course of 1978, Fay Weldon and her peers would find themselves increasingly faced with science fiction material from Britain and Hollywood.

Star Wars had just opened in time for the new year and, not entirely by coincidence, the BBC unveiled its major new foray into sf on January 2nd: **Blake's Seven**, a series whose production team made it look like **Doctor Who** Revisited, including people like Terry Nation, David Maloney, Chris Boucher, Ian Scoones, Roger Murray-Leach, and many others who had so boosted Doctor Who's standards in recent years.

For its first episode (THE WAY BACK), *Radio Times* devoted a big colour feature to launch the series. While beneficial to **Blake's Seven**, this may be the reason why **Doctor Who** received such small coverage the following week.

Fortunately, the British national press was more sympathetic. Most of the Saturday tabloids on the 7th January ran features and publicity stills from UNDERWORLD although, unusually for Doctor Who, coverage was equally given to the serial's male guest star (Alan Lake) as well as the more obviously photogenic choice of co-star Imogen Bickford-Smith.

News of Louise Jameson's intention to leave Doctor Who had broken by then, and this gave Imogen Bickford-Smith's agent an ideal opportunity to get his client onto the cover of Weekend magazine. She was touted as the "New Doctor Who girl", even though the inside article specified she had only been signed for one show. Perhaps with views of a longer stay, the "darling of 22 TV commercials" had told Jack Bentley for his Sunday Mirror article in November:

*When the Tardis materialises in a spaceship, Dr Who becomes involved with astronaut Herrick (Alan Lake) and his eternal quest: 6.25 pm*

Radio Times

"I will go along with **Dr. Who** for as long as they'll have me." This turned out to be four episodes.

Public enthusiasm for space opera stories, coupled with waning interest in the lacklustre Man from Atlantis series on ITV, brought UNDERWORLD's viewing figures back above average. After hovering around 9 million for the first three episodes, part four captured 11.7 million viewers: this put the series into 27th place on the national viewing chart, its highest position for the season.

Although Doctor Who took a fortnight's rest over the Christmas period, THE ROBOTS OF DEATH was repeated as two 45 minute episodes on Saturday December 31 and Sunday January 1. These compilations were virtually unedited, ran at 6:25pm and 4:45pm, and brought in audiences of 10 million and 7 million. □



# THAT'S NO OLD LADY..

Imogen, aged space pilot.

**DR. WHO'S new girl is eighty-five years old. Well, for some of the time, anyway.**

She is the pilot of a space ship that has been travelling among the stars for years.

She will be rejuvenated from time to time in the series, to emerge as the 23-year-old beauty she really is.

Her name is Imogen Bickford-Smith, darling of 22 TV commercials plugging everything from bubbly drinks to airline tickets.

Her debut will be in January, when Louise Jameson, the Doctor's present side-kick, prepares to bow out of BBC-1's long-running sci-fi series.

"I don't mind appearing as an old lady," says Imogen, "though the hours it takes to be made up are wearing.

"I've done it before, in an insurance TV commercial. I started off in that as an eighteen-year-old and ended up as sixty-five.

"Perhaps that commercial sparked off the idea of casting me in the Dr. Who part."

Imogen's real-life qualifications for what promises to be an active role are impressive.

She is a brown belt judo expert, she fences for Surrey and is an experienced riding instructress.

As a public schoolgirl she got ten O-levels at sixteen, and now spends her spare time studying law with the Open University. Her father is a solicitor, her mother a barrister, and her uncle is a Q.C.

So far her acting career has been chiefly notable for a telling performance in a recent BBC-TV Jubilee play called Our Kid, in which she played a model emotionally involved with a photographer.

Now there's a coincidence! In real life too, she is in love with a photographer.

"I've been unofficially engaged for three years to motoring photographer Geoff Senior," she says. He is 38.

"We plan to marry in about a couple of years. I want to settle down then and have babies.

"Until then I will go along with Dr. Who for as long as they'll have me."

JACK BENTLEY Showpage

# THAT'S Dr WHO'S NEWEST DOLLY

Imogen, after rejuvenation.

# Playing the Blues

## ANDREW MARTIN buries some myths about UNDERWORLD

BOB BAKER and Dave Martin's second script for the fifteenth season of **Doctor Who** is one of a long line of **Doctor Who** scripts with an uncredited extra author. In this case it is not the script editor or another trusted, experienced writer but the generations of Greek storytellers who created and refined the myth of Jason and the Argonauts. While stories such as THE BRAIN OF MORBIUS are reworkings of classic tales of literature under greater or lesser disguise, UNDERWORLD is an instance of a story owing so much to its roots that the authors feel obliged to acknowledge the fact in its closing moments: "I called Jackson 'Jason'? ... Jason was another captain on a long quest."

UNDERWORLD is a story with problems. The first story not to be script-edited by Robert Holmes since 1974, it is as if the guts have been torn from the programme. Many stories before this have been run-of-the-mill, few have been quite so dull. In some ways it is hard to understand how things went quite so wrong. Baker and Martin were two of the series most experienced and regular writers - reliable, experimentive and witty. Norman Stewart, while new to the job of Director, had a wealth of experience as Production Asistant (the job now called Production Manager), his first Who being THE DALEKS. But in other ways the story is doomed to fail: obviously done on the cheap, it is written, acted and directed with a sort of world-weary plodding confusion that echoes the Minyans' state, but makes the story often tedious.

Apart from the regulars there are three main groups of characters. There is the crew of the Minyan spaceship R.1.C.; the Trogs, enslaved subterranean inhabitants of the planet that has formed around the lost spaceship P.7.E.; the guards and Seers who serve (yet another) super-computer, the Oracle.

We meet the R.1.C. crew early in part one - which is easily the best episode. They are yet another slice of Time Lord mythology, a race which the Time Lords encountered when they had just begun to explore the universe. Having given the Minyans the benefit of their superior knowledge, the Minyans kicked the Time Lords out and proceeded to war amongst themselves (another occurrence of the Baker/Martin anti-colonial theme). Ultimately, the Minyans all-but destroy themselves.

This set of events apparently inspired the Time Lords' policy on non-intervention, but the only inspiration remaining with the inyans is the power of regeneration. As with the later Kastrons in MAWDRYN UNDEAD, this regeneration is dependent upon machinery, and is also seen in many ways as a curse. Here Tala (the only female crew member) almost goes beyond the point of recovery, as Herrick says: "deliberately... just like all the others" presumably out of weariness at the prospect of her thousand and somethingth new body. It is perhaps weariness which also prevents any of the crew from having much of a personality. They are all rather one-dimensional - Jackson is the noble leader, Orfe the amiable one to counterbalance the aggressive Herrick (the only one of the crew who actually does anything - and that isn't much). Then there is Tala, whose entire potential is used up once she's done her regeneration stunt.

Episode one's strength comes from its setting up of some *big* science fiction concepts: the Time Lord history, the instant work-a-day regeneration (which apparently has a few after-effects after you've done it a few thousand times), and the nebula - whirling away to create planets at the edge of the known universe. Probably the only moment of real wonder in UNDERWORLD comes in part two, when the planet that has formed around the P.7.E. becomes visible through the nebula's gasses.

But episode two is also where the trouble really starts. To be fair to Baker and Martin, it's likely that they wrote the story hoping for filming in real caves - or at least real studio sets. But the underworld of the title is created using ChromaKey on a scale never before attempted in the series (and probably anywhere on television). Previous stories had used the technique to insert backgrounds for establishing scenes or special effects, but it was unprecedented to try to create an entire environment with it. That said, Baker and Martin were always enthusiastic about ChromaKey, seeing it used extensively in THE CLAWS OF AXOS and THE MUTANTS. But here, one of the problems seems to be that the environment is too ordinary, too dull. Brightly coloured caves of a more alien nature might have looked better in the circumstances (like the radiation cave in THE MUTANTS). The writing and direction of the story are a bit leaden, but the worst offense is the visual dullness.

The reason for this is, as with THE MUTANTS, that with so many layes of ChromaKey, any bright colours in the real sets or costumes could have been switched out along with the blue backdrops. As it is there are still evident problems when characters move, and in one shot in part three parts of the Doctor's face vanish as he crosses the set quickly, his face reflecting the blue of the background.

But to give credit where it is due, the fact that every angle to be shot had to be set up with its own appropriate nodel background must have been a logistic nightmare - and from the logistics standpoint it works. What suffers is what goes on beside the technical wizardry - the life of the programme, the artistic content. With so many demands from cameramen, lighting engineers and poor Mitch Mitchell struggling with the electronic effects, Norman Stewart seems to have had little time to devote to his actors once they were in the studio. Television is notoriously a technician's medium at the best of times, but with this degree of complication facing them, the actors seem to be swamped by it. Even Tom Baker is, for once, a little lacklustre. His asides are becoming more flippant as he gets more and more obviously bored.

Another factor hardening the performances of the supporting characters, in the case of the guards and the Seers, is the fact that they are encased in huge, flared costumes - greyish white for the ordinary guards, black for the officers Rask and Tarn, and a strange mottled red-brown for the Seers. The baggy hoods worn by all three are there merely to disguise the fact that the Seers have bronze-coloured wastepaper baskets instead of heads. Personally I like the odd touch of science fiction cliche, as with these '30s/'40s pulp sci-fi robots, but this merely serves to reduce the difference between the characters of Ankh and Lakh to their similar voices. As we are never told why the two have robot heads, the only reason seems to be to create a shocking image, which is squandered in any case by having the episode end slightly later with the Doctor and Leela's literal (as it turns out) cliff-hanger.

The Trogs are no wild things either, dressed in sackcloth brown without much vitality. Idmon is the cliched agitator roused to rebellion by the death of his family. Idas, his son, is full of superstition and clues to a truth about the underworld which we already know - to us it is no mystery that above the *sky* there are stars. Neither Idas nor Idmon have any sense that they are the descendants of an ancient race, and Jackson doesn't seem to care too much about the fact either - he is about to throw the extra weight of the surviving Trogs off his ship at the end until the Doctor reminds him that here are human examples of his race to populate Minyos II. Even then, Jackson blames this extra weight when it seems that they will be pulled back by the P.7.E. planet's gravity.

One might wish that more had been made of the computer the Oracle. The R.1.C. has no such voiced computer, and the only mention of its origin is that it rants: "There are no gods but me - have I not created myself?" But as this is never investigated, it remains a matter of speculation as to whether it is fact or cyber-megalomania. We have seen the Oracle too many times before, from WOTAN to Xoanon, to be interested. It is just another lame in-reference to the Jason myth.

THE regulars are not in particularly sparkling form, either. With the director preoccupied, there is no strong hand to restrain Tom baker's inventiveness, and he strolls nonchalantly through chokng gas, maser beams and a ChromaKey landscape, borne along on the relentless current of Dudley Simpson's turgid score. The dictum that humour replaces violence is least effective here: although there is no violence other than being crushed by polystyrene rocks or being zapped by an electronic-effects ray gun, the jokes are just as artificial and ineffective. The Doctor's quip about people eating processed rock in Blackpool is the nearest we ever come to laughing. The following exchange just leaves us gaping in bewilderment:

DOCTOR: Have you ever heard of the Flying Dutchman?

LEELA: No.

DOCTOR: Pity, I've often wondered who he was.

Is this the man who was once the omniscient time traveller we knew and loved? Can he even be the witty man who helped free the transported Earthlings on Pluto so recently?

Leela battles on bravely, with a Jamie-like naive superiority complex, blufing herway to imagined respect from people evenmore primitive than she is. The pacifier device (forgotten, as was the Minyan's regenerative ability, after part one) leaves her docile, then angry and paranoid when the Doctor snaps her out of it.

K-9's contribution is as irritating as usual, consisting of smart-alec observations, a refusal to let the Minyans leave the Doctor when they recover their race banks, and the discovery that it is much easier to traverse uneven cave floors if you are ChromaKeyed onto them.

So much is wrong with UNDERWORLD that it seems unkind not to try to see its better points. Although the talents of Janathan Newth, Gerald James and Richard Shaw are sadly wasted, at least the erratic Alan Lake (Herrick) manages to shine through a little. The model work, unusually filmed on 35mm stock, is very efficiently done. It is very much a case of "if only...". If the caves had been real (location or studio); if there had therefore been less reliance on ChromaKey, which deadens the visuals so much and denies the actors their environment; if the performances had been sharper; if life had been tweaked into the mediocre script. If this was the best that could have been done, then "I'm a budgie's cousin."

# Production

The story of UNDERWORLD is about how resourcefulness saved a programme from near-disaster.

UNDERWORLD is remembered by production team and audience alike as "the one with all the ChromaKey in it". (The BBC in-house term for the effect is Colour Separation Overlay, or CSO.) But without that ChromaKey work, either there would have been no UNDERWORLD story on air, or its successor THE INVASION OF TIME would have suffered severe underfunding, the loss of some episodes, or both.

At the same time, the pressure to use such a quantity of ChromaKey brought important benefits for **Doctor Who** in the long run. Firstly, it got the series gallery post-production for the first time in its history (that is, studio days without actors, using only the V.T. and grams facilities, plus the gallery team). Secondly, as a result of achieving post-production, it significantly improved **Doctor Who**'s standard of visual effects.

UNDERWORLD was **Doctor Who**'s first step in that direction, making the programme something of a milestone. But it was not intended to be at the outset. Neither was it intended to become a contender in the record books for the number of ChromaKey scenes that could be shot for one programme in a single day. And yet it succeeded in becoming both.

## Spending

The situation arose when producer Graham Williams found out there was no more money in the kitty for **Doctor Who**. For three years, the show had consistently overspent. As far back as THE ARK IN SPACE, the previous producer Philip Hinchcliffe had argued for more money for sets and props, and had got his own way. Then in 1977, and not for the first time, Graham Williams was called to account for his predecessors actions as the BBC reviewed its perspective on **Doctor Who**. Television costs in general soared during the late seventies as U.K. inflation an out of control. With ever more frequent strikes occurring both at the BBC and at Independent Television (ITV), it was inevitable that programme spending would be more closely controlled.

Going by his account (see page 3), it was during the making of UNDERWORLD that this truth was spelled out to Graham Williams. The show would run to budget now, or it would not run at all.

Production Unit Manager John Nathan-Turner told **IN-VISION**: "The reason UNDERWORLD was done on ChromaKey was the Designer expended an awful lot of money on the first studio. I didn't find this out until quite close - maybe a week or so - before the first studio session.

"The Production Unit Manager gets all the contracts, which the Producer (or the Production Unit Manager) sign. The Design department in those days suplied me with their contracts not very soon after what's called the design-agreed date, which is when everyone is happy with what this production will look like. When this particular contract came it, it was just colossal. We managed to cut a few bits off the spaceship set, but they virtually spent the design allocation for the whole story on the first studio.

"It was the last but one story of the run, so we couldn't spread the costs to the others as there was only THE INVASION OF TIME left to make. We were lucky that for INVASION OF TIME they asked us to go on location because they had a problem finding studios for us. For that they gave us what I estimated to be the additional charges. So that production was financially self-contained, with an accurate budget. Going into INVASION OF TIME we had to be level and the books had to balance."

## Scripting

The origins of UNDERWORLD (*Underground* was its very early working title) lay in the show's tradition of spoofing source material from films or literature. Script editor Anthony Read had learned from his predecessor Robert Holmes how sucessful this could be in **Doctor Who**, and was happy to use it when commissioning his remaining two stories of the season.

Read selected Bob Baker and Dave Martin as his primary script writers, because of their reliable track record in delivering workable scripts on time and sometimes at short notice. Entrusting that first commission to them would free Read to give more attention to David Weir's script, which he anticipated would need more work from the script editor because the writer was new to **Doctor Who**. He could not have known just how much work Weir's storyline would ultimately involve. The story of *The Killer Cats* appears next issue.

Read suggested to Baker and Martin that they might want to dip into the classics for their inspiration. Baker and Martin took up this suggestion, as Bob Baker explained to Doctor Who Review in 1979: "It was a homage to great stories. Fantastic Voyage was a good story and THE INVISIBLE ENEMY lifted sequences from it. UNDERWORLD was based on the voyage of Jason and the Argonauts. There were some subtleties which you may have noticed, like Persephone was the P.7.E., and the characters had jumbled names from some of the Argonauts. It was a Golden Fleece they were after too, in the form of the race bank.

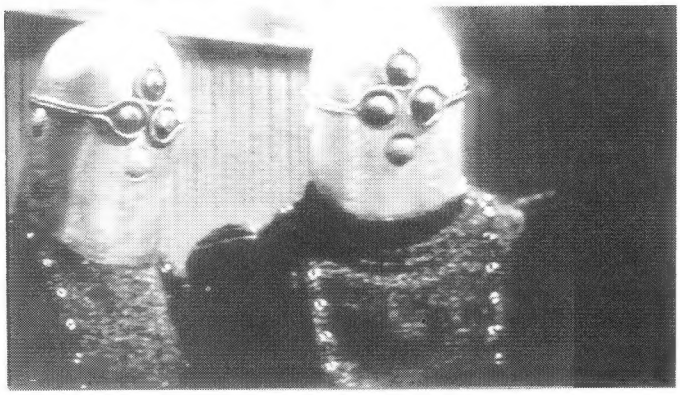
"Another thing we liked about that story was how we had the fight scenes done with a sort of dance quality to them, with shields on their arms. We wanted some sort of ordered routine to the way they went about it. I thought that came off very well too."

Some of the Jason and the Argonauts references which were disguised (to a greater or lesser extent) were: R.1.C. (Argossey); Jackson (Jason); Herrick (Heracles); Orfe (Orpheus); Tala (Atalanta); Minyos (Minos).

One restriction the script editor and the writers worked with was that they could not plan any location work. THE SUN MAKERS had effectively put paid to that, with its allocation of two filming blocks instead of the normal one. That cost had been partly redressed by limiting the second studio block on THE SUN MAKERS to just one day, but there was still a need to balance budgets before the end of the season. Confined therefore to studios, Baker and Martin anticipated three main set elements: caves, large vaulted sets for the P.7.E., and smaller ones for the R.1.C.

Their visual inspiration for the R.1.C. was a combination of the Concorde aeroplane (which had captured the British imagination in the early seventies) and Taylor's spaceship from Planet of the Apes, and with a vague allusion to the sailing vessel captained by Jason in his voyage with the Argonauts. True to form, Baker and Martin wrote a lengthy description of the ship in their script: "A battered but sophisticated multi-hull space vehicle with a solar sail and tiny points of light pulsing from the ion drive pods. We hear the TARDIS materialisation sound as the ship comes towards us like a giant ray and passes over us. On the underside is the stylised legend 'R.1.C.' The ship is large and takes quite a long time to pass over us. Several patches show. Only when it has done so do we see that it too is heading slowly but surely for the now very distant spiral nebula.

"The interior is spacious with wall-to-wall H.U.D.s, navigation screens and function displays. The pilot sits at the front, the pointed end, and is driving the ship on manual and optical systems at the moment. The system is that a shutter, like 'The Concorde', can be lowered as necessary.



***The Seers - Ankh and Lakh***

"The pilot is of heroic stature, as are the other three. Unlike them Tala is, at the moment, grey-haired and ancient. Her uniform, like the others, is a padded spacesuit which owes something to American Football gear, and equally something to the sculpted body armour of Ancient Greece.

"The ship has been in space for roughly 100,000 years. During this time the crew has cloned itself 1,000 times. Each man or woman lives from 25 to 85 and then goes into the cloner to come out as a 25-year-old. But because of all the replication the crew are all sufering from what might be called Genetic Fatigue. It has made them laconic, massive and slow-moving until there is the stimulus of a real emergency. Nevertheless they are taned, fit and good-looking like Greek heroes, American astronauts or Australian male models."

## Costumes and props

All the BBC departments working on this story saw an oportunity to shine. Picking up on the above descriptive text, costume designer Rupert Jarvis set out to create spacesuits that would be noticeably diferent to the *2001* or Apollo mission versions. Later drafts of the scripts have the references to American Football gear and Greek body armour deleted. Presumably, Jarvis had by then decided on a more Eastern approach to the costumes - the padding concept was retained, but scaled down so that the actors would not suffer too much from the heat on a long studio day. Instead, to fill out the spacesuits, an elaborate web of fabric piping was sewn in, and the costume surmounted by a weaved hessian space helmet.

The shield guns were the invention of special effects deigner Richard Conway. They combined the idea of the Minyans carrying both a laser blaster and some kind of dish aerial that captured and deflected ray bolts. After consultation with electronic effects designer A. J. Mitchell, it was agreed that these guns would have a working light on them as an aid both to the actors and the gallery team who used it as their cue to line up the optical efects (see below).

A casualty of the spending restrictions was the appearance of the Seers. The script describes them in the following descriptive text: "A shadow falls across Herrick. It is Ankh. He wears a purple cloak with Klu Klux Klan eye slits in the hood. Behind the slits is the glitter of red, glowing eyes. When we finally seee Ankh with his hood off he has a metal head, bronzed like a 'Burton' tailor's dummy, bald like Yul Brynner and with glittering red eyes. Being Seers, they have a third eye in their foreheads. The reason why they have metal heads is bionic. They are linked to the computer Oracle and therefore have a kind of telepathy with it."

The trimmed budget would not run to specially-sculpted and moulded head pieces, and so cheaper, cylindrical headwear was used. This retained the idea of three eyes and a bronzed appearance.

Script editor Anthony Read said of the Seers in 1978: "The computer created them. They were servants of it, created as extensions of itself, and were the equivalent of high priests in Greek legends."

## Tala

Make-up spotted their chance to shine with the need to age actress Imogen Bickford-Smith by some sixty years. At that point (late 1977), prosthetic appliances were still some years ahead for the Make-up department. So the ageing process was done using the traditional methods of cotton wool strands, latex paint and face powder. The scenes with the aged Tala were recorded first, because the time taken to remove the make-up and restore the actress to her real age was far shorter than the hours requires painstakingly to apply it.

Much of the press publicity was given over to Herrick, played by "tough-guy actor" Alan Lake.

(Lake was husband to actress Diana Dors, and by coincidence they had an eight-year-old son called Jason.) But a lot of attention also fell on Imogen Bickford-Smith (Tala).

Partly, this was because the press call was on the day she was required to wear the ageing make-up. But equally, it was a move by her agent to capitalise on the news (which broke in December) that Louise Jameson was leaving the series at the end of the year, and so **Doctor Who** would be looking for a new female companion.

## Regeneration

The story features regeneration, another reminder of how the series was increasingly dealing with its own history. Bob Baker told IN-VISION: "I felt that the Time Lord mythology in UNDERWORLD was in keeping with the early-seventies brief of non-interference in other worlds."

For the cloning/regeneration process, he and Dave Martin provided descriptive text which suggest ways in which scripts were altered before recording in the post-Hinchcliffe era of the programme: "Tala is lying in something like an iron lung. Tubes and power cables lead into the machine. Herrick monitors the process. It is a painful business being regenerated, but we cannot hear much of the screaming..." (See also 'Script changes' below.)

## Sets

The Regeneration Chamber itself was not actually a set, but a glass painting, over which was laid a live-action picture of Herrick (presumably controlling the process), with the composite shot relayed to a black-and-white monitor on the bridge.

The sets which casued all the problems for UNDERWORLD were the R.1.C. spaceship interiors. Designed by one of the BBC's top creative minds, Dick Coles, they were very large because they were split-level, very lavish because they had lots of working props and specialy-moulded the computer chamber in detail, references are made to the race bank cylinders being inside the head of the Oracle, implying that the focal point of attention in the set would be some kind of giant head. Specifically, in episode three mention is made of a panel opening in the head of the Oracle, revealing two bars of light which gradually coalesce to form the fake race bank cylinders. Whether all these ideas were pulled at the planning stage or the point where the budget crisis arose is not clear. Certainly, however, a major casualty of the spending cut was the underground set, which required so much ChromKey work, as A.J. Mitchell explains elsewhere this issue. (See below for studio details.)

## Script changes

Studio recording began in studio TC4 on Monday October 3rd, 1977 for two days. In this time, all the R.1.C. scenes and the TARDIS interiors were shot. A last minute addition, possibly one of Tom baker's many volunteered contributions, was the Doctor's late entrance dressed in a painter's smock and cap. Even the camera script has the Doctor already in the control room, dressed normally, when the scene begins.

Another alteration is the Doctor's comments about regeneration in episode one. Originally "I've been through it once or twice... no, I tell a lie, three times; most unpleasant", this became just "I've been through it two or three times. Not pleasant."

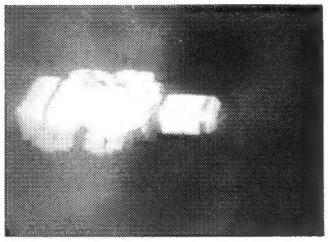
## Miniatures

A section of the budget that was not cut was the filmed miniature work, although this may have been because most of it had been shot in advance. Like Ian Scoones, visual effects designer Richard Conway was a fan of Bray Studios' facilities, and arranged for all the R.1.C. footage to be shot there. The spaceship model was some three feet in length and for the most part was flown on wires. However, the camera was moved on a dolly instead of moving the model, to eliminate wobble.

It is not known whether any of the UNDERWORLD effects crew had seen Star Wars before shooting the R.1.C. footage. Press viewing and invitation-only screenings had started as early as July 1977. many of the sequences, and even some of the script references, do seem to pay homage to the "big ship passing over the camera" shot which was so memorable from Star Wars.

Several of the model scenes involving the R.1.C. had to be done using the water tank at Bray, most notably the ship diving into the top surface of the P.7.E. planetoid, and the rock fragments floating down to cluster around the ship. Most spectacular was the shot of the R.1.C. breaking out of its rock cocoon, simply (but effectively) achieved by dropping the model through a fragment-coated shell shaped like half a rugby-football.

Although some pyrotechnic detonations were done to show the ship's fiery trip through the spiral nebula, a lot of the coloured lighting and flaring effects were added or enhanced during the post-production phase. One significant combination of mechanical and optical effects was the nebula itself. The model was a simple spiral-painted circle of plastic, spinning on



***The R.1.C. in space***

a turntable. Above it was a shallow cone of 'mirrorlon', slightly distorted to give a moving pattern to the reflected edges of the spiral when seen by a slightly defocussed camera. recorded in the studio, the playback was then enhanced by adding electronically-generated colours and glows.

## Post-production

Combining filmed model and miniature work with electronically-composed opticals is very difficult in a "live" studio, because of the need to concentrate on recording work on the studio floor. Post-production meant that the production team did not have to worry about keeping a studio full of actors and technicians busy. The director was free to concentrate on getting the "look" of the show right using the material he had already recorded.

Today, this is nothing unusual in television. As electronic effects designer A.J. Mitchell told IN-VISION: "Even *Star Trek - The Next Generation* no longer composes its effects on film. Once the film is shot, the first thing you do is dump it down to tape. It is much quicker, and much, much cheaper for TV companies now to have their effects added electronically. All the beams and phaser blasts are added from effects machines working directly with tape sources."

So a first for UNDERWORLD, and one made possible by post-production, was the inclusion of "ray gun" bolts which emerged from guns and "travelled" to their target, instead of just appearing as a straight line betwen gun and target (like K-9's red blaster effect). Previously, only THE MOONBASE had used a travelling laser bolt, and that had been a piece of animation footage from the BBC's Graphics department.

A lengthy description of the UNDERWORLD shield gun bolt appears in *Star-*

# Production

*The TARDIS is drawn into the spiral nebula*

*burst* issue 30 (published in 1981). The effect required two passes of the pre-recorded tape during post-production. On the first pass, a generated diamond shape was put over the victim, supposedly showing the point of impact. On the second pass, the pre-drawn, shaped and coloured ray was added by the old technique of pulling strips of card away to reveal the ray to the camera. The major advantage that post-production should have given this process was that freeze-framing pre-recorded images made it possible to line up effects with great accuracy. However, the video machines were unable to manage this, and A.J. Mitchell had to add the effects in real time. This meant playing the sequence through several times over (reducing the quality of the image in the process), marking the positions for the start and end of the bolt effect on the monitor screen with a chinagraph pencil.

Mitchell also used an additional U-Matic tape machine, which produced lower-grade images than V.T. expected. Nevertheless, the effects were accepted as broadcast quality.

## ChromaKey in the studio

Anthony Read said of using ChromaKey "It was really exciting to do it that way, it was not how we intended to do it. In the first place it was originally intended to do it on film and in the studio. It turned out when we came to it that the cost involved to build the sets in the studio would be so enormous that it was not on. The designer and director came up with the idea to do it on CSO. They were able to convince Graham and me that this was a viable way which was exciting. Throughout the programme's historyit has been a very innovatory show technically. The technicians have always enjoyed the chance to stretch and extend their armory. and improve their techniques. It came off very well in UNDERWORLD."

The main ChromaKey days were Saturday and Sunday of block two, which ran four days from 15th to 18th October. For much of that weekend, more than half of studio TC3's space was taken up with giant blue ChromaKey backcloths and flooring. The remaining space was allotted to the model cave sets, each of which had to be carefully lit, just like their full-size counterparts. Lengthy line-up sessions, involving placing blue 'X's onto blue flooring, were required to mark out the precise routes tha actors would have to follow in front of the cameras.

Assistant Floor Manager Gary Downie recalls it all as "a nightmare just trying to keep everyone happy. Everything had to be so precise. If just one person ran a few inches the wrong way, you'd be into a rerun."

Some scenes had to involve props as well, most notably the climax to episode two as the Doctor tries to stem the flow of fumigating gas. Orginally, his task of opening up the air duct and rewiring the vane motor mechanism was more visually involved. But Tom Baker could not be seen working in anything but a very restricted camera angle relative to the ChromaKeyed set, and so much of the drama was lost.

The most complicated sections to record were the rope bridge fight scenes over the chasm leading to the P.7.E. With live action elements, model sets, actors and ray gun effects all involved, it took the longest time to rehearse and record, and almost ran the production into overtime.

The last scenes to be recorded in block two were those set in the Oracle chamber, and in other rooms aboard the P.7.E. Those ran through to October 18th, after which the lengthy post-production work and V.T. editing was carried out on October 19th and 20th (episodes 1 and 2), and on October 24 to 28th (episodes 3 and 4).

*Leela, Jackson and Idas in the (model) tunnels*

## Music

A simple scene to record in the studio was the anti-grav lift, an ideal scene for ChromaKey. A curiosity about the scene is the little passage of 'bouncy' music that runs through it, seemingly out of step with the rest of UNDERWORLD's quite sombre soundtrack. When Dudley Simpson was putting together the music for the episode, he was visited by members of the Doctor Who Appreciation Society (DWAS) for an interview. They brought tape recordings of past music he had written for the show, including a piece from THE MIND OF EVIL (the sequence where the Doctor tells Jo Grant how Henry VIII imprisoned him in the Tower of London.) It may be co-incidence, but the two themes are very similar. All the incidental music for UNDERWORLD was played by an orchestra of six musicians, conducted by Simpson.

## Transmission

Despite the fact that several sequences were used more than once (the guards going to investigate the skyfall near the start of part two, for example), the first three episodes of UNDERWORLD ran quite short. This is probably a reflection on their complex production requirements. Each ran less than 23 minutes, with episode two under 21 and a half minutes. Episode four, however, made up for this by overrunning to nearly 25 and a half minutes.

## Trivia

Reminiscent of her first trip, Leela is operating the TARDIS as the story opens while the Doctor paints. The Baker and Martin catchphrase this serial is "The Quest is the Quest". Mention is made of the Lieber Mann Maser, which fires charged particles along a laser.

Bob Baker told IN-VISION his memories of the serial: "I thought the decision to do ChromaKey work was brilliant, though a bit shakey because it was new. It didn't quite come off - very nearly, but not quite. It was held together by some fine acting. It was very brave of the director to do it, and absolutely right as well. I didn't know that was what they were going to do before writing the story. I thought they'd use the usual set corridors. I prefer location, of course - you never know your luck - but I like someone to be bold and day 'dammit all, we'll do it all in ChromaKey'."

For some reason the BBC holds no records of the names of the extras and walk-ons for this story (although some, like John Cannon) can be recognised from watching the programme.

The BBC records are also at odds with each other in some aspects. For example, some say that the studio recordings were in TC3, others say TC4. The VT editing of 27-28th October is also only referenced in some BBC sources.

Tala deliberately exceeds the regeneration point, a way in which Minyans commit suicide on their long voyage. Her response to the regeneration is memorably summed up in Terrance Dicks' novel: "Once again, she had been sentenced to life". The book, first published in 1980, uses a reference photo for the cover art (by Bill Donohoe) from HORROR OF FANG ROCK (see cover of IN-VISION issue 24). The book's title was *Doctor Who and the Underworld.*

At PanoptiCon 6 (in July 1985) Bob Baker and Dave Martin said that when they wrote UNDERWORLD, they hoped for a spin-off science fiction series about the P.7.E. based on other Greek myths.

Unlike previous apppearances, the TARDIS travels through space without spinning. □

# Drama at the BBC

In the first part of his interview with **IN-VISION,** Graham Wiliams recalled the events which brought him to Doctor Who. He arrived to find the program in a state of crisis, with his script editor and lead actress both wanting to quit; pressure was being exerted by his BBC bosses to revise the programme's dramatic content; and his first planned story was cancelled. By the time January 1978 rolled around, Graham Wiliams was justified in feeling he had found solutions to these problems, and that the worst was over. He was mistaken.

K-9 was an attempt to pull back the younger audience. I was either being told, or I was aware anyhow, that we were leaving the younger elements of our audience too far behind, and that something should be done to remedy that. After all, K-9 was virtually handed to us on a plate. We never met with Bob Baker or Dave Martin to discuss it beforehand. It was just a concept that semed to leap off the page when we read it, and after that it was catch as catch can all the way. I don't think anyone would disagree that it took Visual Effects over two years to get the beast working properly. Bob Holmes was absolutely right when he described the panic of those months, simply because you could not sit down and plan anything. Everyone working on future series was also working on the present series, and I did not feel I could just break in on designers' drawing meetings or Visual Effects' planning sessions, grab the guys I wanted from Philip, and say: "Sod your production mate, I'm worried about what's happening on my shows".

On the other hand, when Philip Hinchcliffe was planning future **Doctor Whos**, he would take his present designer (as I did later on) and say: "OK, that deals with the present one. Now let's have a quick chat about what we're going to do on this future show". He had access, therefore, to plan whole seasons ahead in that way.

My problem was not being able to get my hands on anybody until after Christmas, where at that point we were due to start production at the end of January.

The plan I had was to match scripts with certain characteristics to directors who could complement those strengths and weaknesses. But even that fell foul of the nightmare when *The Witch Lords* fell through. Although I do think I managed to even things out towards the end of the season.

George Spenton-Foster was a tried and tested traditional director. I had known him from our days on **Sutherland's Law** and **Z Cars**, so he was perfect for our outdoors, rural England IMAGE OF THE FENDAHL story. So too was Pennant Roberts for THE SUN MAKERS, because he had a good technical background.

Norman Stewart and I got together during THE INVISIBLE ENEMY while that panic was going on upstairs in the gallery. The disasters we had on that show were not Derrick Goodwin's fault. Nothing in his experience had prepared him for that madhouse, but Norman helped him so much from the floor - lining up shots, for him to take in the gallery that worked. So he certainly got my vote for trying a director's job of his own. He was also very good at getting good performances from Tom baker, and not leting him get away with much. That was a problem I certainly came up against time and time again with Tom.

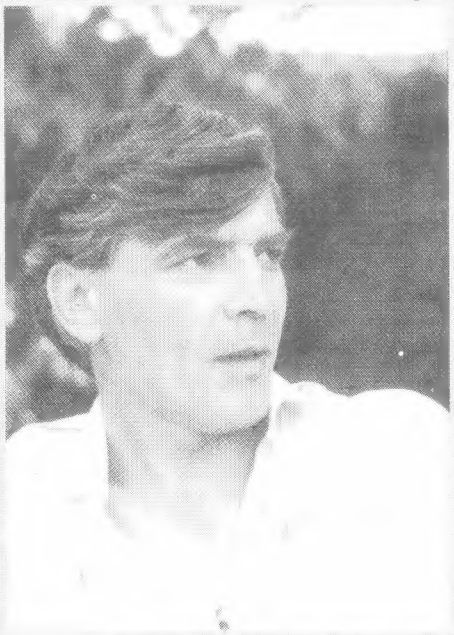
Paddy Russell and Louise Jameson both suffered terribly at the hands of Tom Baker, and it took me a long time to understand why. I still didn't believe it for a long while, but I think the truth is that Tom Baker is a frantic sexist. I knmow it's true that he used to be extremely fond of the opposite sex, but by a curious manipulation of that same principle he and Paddy got along very badly because she was a woman. He really did not like having to take orders and instructions from a woman director. And Paddy was equally unwilling to make any allowances for this attitude. Indeed, why should she?

On the other hand, the prima donna aspect of leading artists, and sometimes of famous writers, is something you have to live with in a production office. I had worked with Alan Stratford Johns on Barlow, where I took over as script editor on the last season. He was very uncompromising. So too was the king writers, Elwyn Jones, whom many people on the team regarded with breathless awe. My attitude was not to go out there like Gideon with a sword and buckler, but simply to say: "All right pal, if you're going to give me a hard time, please do it now so I don't have to lie awake at nights worrying about itbefore we go into production".

Elwyn Jones and I decided we would not have much to do with each other, because we would simply end up taking chunks out of each other, which really was not worth it. That was all agreed quite amicably. Alan (Stratford) Johns and I ended up getting on very well, and we stayed friends for a long time afterwards.

Not to take something so much to your heart when you are so central to its creation is asking an awful lot of any egocentric, and all writers and all actors are, to varying degrees, egocentrics by definition.

The difficulty I found on **Doctor Who** was that, by the end of our second year together, Tom Baker and I knew ea,/h other almost a bit too well. We didn't know each other socially or intellectually, because we had little in comon. But we knew each other's strengths and weakness and that did get to a point when I had to say to him: "Look, we do know each other well. Now either you get on with your job and leave me to get



# Drama at the BBC

on with mine, or I will have to find another leading man. And unfortunately you are not in the position of being able to find another producer".

But that didn't work. I was called in and told that, unless I mended my ways and gave Tom story approval, casting approval and director approval next season, I would not be employed to produce that third season. Graeme MacDonald (Head of Series and Serials) even called me in from sick leave to tell me that. And that was all because Tom Baker had pushed a postcard through my door a few days earlier to say that he wouldn't be doing **Doctor Who** any more.

I took that card to Graeme MacDonald with the argument that we were going to have to recast, because there was no way that I was prepared to give that amount of power to a leading actor.

Graeme said in words to me that he had had a meeting with Bill Cotton (Controller of BBC1), and there was no question raised about my having failed in my job. It was simply a direct choice between Tom Baker and me.

Bill Cotton and Graeme MacDonald had agreed at that lunch, if the choice had to be made then they would choose Tom baker. The name of Graham Williams in *Radio Times* is not going to deliver 13 million viewers on a Saturday night the way Tom Baker's name did.

My response was to say: "Fine, that's your decision. But still don't expect me to give the leading actor in a show script approval, casting approval and director approval".

Shaun Sutton (Head of Drama) was out of the country while all this went on, so I added that as it was Shaun who had appointed me as a producer, it was to Shaun that I should actually refer my reasons for not being able to continue. Graeme thought that was perfectly fair. We had a meeting with Shaun the day after he got back to the country - the same afternoon on which Graeme MacDonald came to me and asked me to fire Tom Baker.

I told him that I didn't want to. I felt he should. And that didn't go down too well either. In the end, there was a meeting of the three of us in Graeme's office, with Tom airing his grievances and me airing mine. It went on for several hours, at the end of which the question was posed: could we two still work together. We both said yes, so Graeme said: "Fine. Get on with it".

**Herrick and the aged Tala**

The crux of that whole matter had been Tom and I knowing each other too well, and Graeme not knowing Tom at all. Graeme had been approached by the extremely powerful personality of Mr Baker (which I had had time to get used to over two years), and Graeme comes from a background of one-off plays where very potent and powerful actors and actresses are run-of-the-mill. He had taken Tom too much at his word.

Tom, by and large, had been talking out of the back of his neck. By the time you've had your ninety-fifth drunken conversation with Tom, where he explains to you that the ideal companion for him in a **Doctor Who** story is a cabbage that could sit on his shoulder so he could turn to it from time to time to explain the plot, you're used to his eccentricities. Graeme MacDonald, however, was hearing all this for the first time and, I think, was firmly convinced by the end of this business that Tom had been pulling his leg all along. Maybe he had.

Tony Read was, for me, a very obvious choice at the time to replace Bob Holmes, when Bob decided he had finally had enough as script editor. Tony had a very wide experience of script editing, both outside the BBC and inside. After **Doctor Who**, he went on to do the Hammer House of Horror for an independent studio, where he got the chance to do all the gore and horror we weren't allowed to do on **Who**.

Originally, Tony had approached us to submit a storyline to **Doctor Who**. He and I knew each other from The Troubleshooters, and he and Bob for a lot longer than that. Bob thought very highly of him, so my response was very much to say: "Fine, we like the story. And while you're at it, would you like to become the show's script editor for a year?".

It was inevitable that the style of **Doctor Who** would change once Tony took on the burning torch. But of course, one can never predict precisely how in advance. In all honesty, and with no detriment implied either to Tony Read or Douglas Adams, I have to say that I would have been a very much happier chap had I had Bob Holmes as my script editor throughout all my seasons, as Philip had done. I certainly felt I was one more of a wavelength from the word go with Bob than I was with either of the others. It tok working towards with the other two, but Bob truly had found the natural slot for **Doctor Who** in the television universe.

UNDERWORLD was never intended to be a radical departure from the kind of stories that had gone before. After all, **Doctor Who** had mimicked *Frankenstein* in THE BRAIN OF MORBIUS and Fu Manchu in THE TALONS OF WENG-CHIANG, so why not an older textual base such as Greek mythology for our sources? Given the problems we had with David Weir's *Killer Cats...* story, in retrospect it might have been far safer to point writers deliberately at the classics when they were commissioned. At least we would have known the outline structure of what they were doing for us.

*The Killer Cats...* took forever and a day to write. And when it eventually thudded onto the desk a week before the director was due to join, it was utterly unusable. There were crowd scenes in Wembley Stadium stipulated which, the last time I heard, would have required some 96,000 human-shaped cat costumes. In a way, that is text book proof that some writers are more suited to **Doc-**

**tor Who** than others, irrespective of their background and work on other shows. David Weir is a fine writer, and had obviously been brought on by Tony Read on the basis of work they had done together in the past. But I still remember Tony in my office, with his head in his hands, saying: "I don't understand it. How can he have done this to me?". And that didn't help matters much either.

As I recall, I went down and had two very stiff drinks in the BBC Club with Tony. Then we sat at a table and I started teling him the story of THE INVASION OF TIME. I asked him if he thought he could write the script in six days. He said no, he thought he could do it in two weeks, which he did. It wasn't a detailed storyline to begin with - I imagine if we had been writing it down it would have covered about six or seven sheets of A4 paper, but it was enough to go on.

I have been asked many times where the inspiration for THE INVASION OF TIME came from but I honestly have no idea. Where does inspiration come from? Probably from the bottom of the gin and tonic I was drinking at the time, if the truth be known.

Tony took it away and came back a fortnight later. It still didn't work, but to be fair he was trying something he had nver even tried to do before: writing a six-part story in two weeks. I had done it before with fifty-minute drama under similar circumstances, but never with anything of that length that had to come to a cliff-hanger every twenty-five minutes. So I said: "OK, you've had your crack, it's about time I put my money where my mouth is".

I took the scripts home on a Monday night, and brought them in to be typed on Friday morning - not having gone to bed for four days.

I would not say THE INVASION OF TIME was written to any predetermined **Doctor Who** formula, except that I did bear in mind something that Bob Holmes had said over and over again, because it had caught him unawares from time to time. With any six-parter, you have an absolute bitch of a job at the end of episode four. All **Doctor Who** stories tend to end comfortably at the end of episode four, and yet with six-parters you still have two more episodes to go. Bob's device was always to use a sort of 'dog-leg', where the story goes off into a kind of sub-plot or a tangent and then comes back again in time for the big finale in part six.

I tried that same ploy with, I think, a degree of success, holding back the appearance of the Sontarans until the end of part four. Of course, the whole thing would probably have looked a lot better had the production of the story gone smoothly thereafter. But that was not to be, either.

On each of the three years I did on **Doctor Who**, at exactly the same point in time (which was about mid-November), we would have the *Crackerjack Clock* incident.

The *Crackerjack Clock* is a generic title for a dispute, in those days of some fourteen years standing, about demarcation as to whether it was the Props department or the Electrics department who turned on the clock to start the children's programme **Crackerjack**.

This year it occurred halfway through the pre-prep for THE INVASION OF TIME. The Planning people phoned up and said: "We can't let you have the studio dates you want because we've got too big a backlog of Christmas shows queueing up. Neither can we offer you an extra option on filming".

What they could offer us, however, was one studio, one block on Outside Broadcast, then our filming. But as things turned out, we were only able to get filming for about two days, as the film crew were needed elsewhere. The rest had to be rejigged onto OB.

That effectively meant we had to rethink all our visual effects plans for the Vardans into something that could be done quickly on OB. And in those days, before you had access to things like Quantel and Paintbox, the number of effects you could do on OB was strictly limited. We hadn't even then cottoned on to the trick of doing post-production work in the gallery, which was a small bit of wool-pulling over the eyes of BBC management we achieved in my third series.

Aside from the appearance of the giant phallic symbol in THE CREATURE FROM THE PIT, those weeks were my worst moments on **Doctor Who**. In fairness, BBC Planning did ofer me another alternative - just don't make THE INVASION OF TIME and reuse the money elsewhere on the show. But I didn't want to do that. I really wanted to do the story, despite its problems, which is why I pressed to get Gerry Blake as director. Gerry has a wonderful sense of humour. He is one of the few people I know who can hold a cast and crew together, and keep them smiling under the most appalling conditions. And believe me, they didn't get much more apalling than on THE INVASION OF TIME. □

**Herrick and Jackson hold Leela and the Doctor at gun-point**